

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : **09-274218**

(43)Date of publication of application : **21.10.1997**

(51)Int.Cl.

**G03B 9/00**

**B32B 27/08**

**B32B 27/18**

**B32B 27/20**

**C08J 7/04**

(21)Application number : **08-108657**

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(22)Date of filing : **05.04.1996**

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### (54) **LIGHT SHIELDABLE FILM**

#### (57)Abstract:

PROBLEM TO BE SOLVED: To provide a light shieldable film for optical apparatus which is lightweight and is excellent in performance, such as light shieldability, slipperiness, wear resistance, antistatic property and flatness and is excellent in productivity as well.

SOLUTION: This light shieldable film is formed by using a film essentially consisting of a thermoplastic resin for a base material film and providing both surfaces thereof with layers consisting of thermosetting resin contg. carbon black, lubricants and matting agents. The base material film is preferably a biaxially stretched polyethylene terephthalate film contg. the carbon black in order to improve the light shieldability. Polyurethane is used for the thermosetting resin layers. The carbon black having excellent colorability and the carbon black having excellent electrical conductivity are used for the carbon black to be included therein in such a manner that the mixing ratio thereof attains a range of 65/35 to 95/5. The layers are so constituted that the total carbon black as the amt. of the addition attains 40 to 70 pts.wt. per 100 pts.wt. total resin component.

### LEGAL STATUS

[Date of request for examination]

01.04.2003

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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**CLAIMS**

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[Claim(s)]

[Claim 1] The shading nature film characterized by preparing the thermosetting resin layer containing carbon black, lubricant, and a flatting in the field of both base-material films which make thermoplastics a principal component.

[Claim 2] The carbon black contained in the aforementioned thermosetting resin layer consists of mixture of the carbon black for coloring, and conductive carbon black. and this carbon black for coloring Channel black, lamp black, the furnace black for coloring, It consists of a kind or two sorts or more of mixture chosen from acetylene black. moreover, this conductive carbon black Either KETCHIEN black or conductive furnace black. Or consist of both mixture, and further, while the ranges of the mixed ratio of the aforementioned carbon black for coloring and conductive carbon black are 65 / 35 - 95/5 The shading nature film according to claim 1 with which the amount of the carbon black contained in the aforementioned thermosetting resin layer is characterized by being 40 - 70 weight section in the amount of the total carbon black to the total resinous principle 100 weight section.

[Claim 3] The shading nature film according to claim 1 or 2 characterized by the thermosetting resin of the aforementioned thermosetting resin layer being polyurethane.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the shading nature film especially used for the drawing wing member for optical instruments, such as a camera for photographs, and a video camera, about a shading nature film.

[0002]

[Description of the Prior Art] The drawing wing member for optical instruments, such as a camera for photographs and a video camera, is for originally interrupting light, and needs to essentially have shading nature. Moreover, since it is also required to absorb light effectively so that light may not reflect on a front face, it is required that a surface layer should be black and should moreover be grinding (mat). Furthermore, in order that wings may overlap mutually and may operate, its smoothness must be good and must be excellent in slipping nature, abrasion resistance, antistatic nature, etc. As a material which responds to such a military requirement, the metal sheet with a thickness of 50 micrometers - about 100 micrometers colored black conventionally has been used. However, when a metal sheet is used, while there are also many advantages and being cost quantity, it is inferior to lightweight nature, and in the optical instruments by which recent years were automated especially, the fault that a motor load is large is becoming remarkable.

[0003] Therefore, the requests of lightweight-izing of a wing mount and, partly, the plastic film which changed to the metal sheet and was black-ized is beginning to be used. What film-ized the plastics which kneaded for example, \*\* carbon black to high concentration as a concrete example, and split-face-ized the front face with sandblasting. Moreover, the thing to which coated with thermosetting lusterless paint the polyester film which made black pigment, such as carbon black, contain as \*\* shutter wing and a drawing wing, and the antistatic agent was made to adhere by immersing processing further. \*\*\*\* is proposed.

[0004]

[Problem(s) to be Solved by the Invention] However, the thing of the aforementioned \*\* had complicated manufacturing processes, such as sandblasting, its cost was also high, and since slipping nature and absorption-of-light nature were made to discover with surface irregularity, it had a fault with large aging of the performance by wear in use etc. Moreover, also about the thing of \*\*, while manufacturing processes, such as immersing processing of an antistatic agent, were complicated, when slipping nature was inferior, there was a problem that conductivity (fall of surface specific resistance) was not enough, either, by adhesion of an antistatic agent. It aims at offering the shading nature film excellent also in productivity for optical instruments while this invention is made in view of the trouble of the above conventional technology, is lightweight and excellent in performances, such as shading nature, slipping nature, abrasion resistance, antistatic nature, and smoothness.

[0005]

[Means for Solving the Problem] The above-mentioned purpose is attained by the following this inventions. That is, invention according to claim 1 consists of a shading nature film characterized by preparing the thermosetting resin layer containing carbon black, lubricant, and a flatting in the field of both base-material films which make thermoplastics a principal component.

[0006] The carbon black contained in the aforementioned thermosetting resin layer invention according to claim 2 And the carbon black for coloring, It consists of mixture with conductive carbon black. and this carbon black for coloring Channel black, lamp black, the furnace black for coloring, It consists of a kind or two sorts or more of mixture chosen from acetylene black. moreover, this conductive carbon black Either KETCHIEN black or conductive furnace black. Or consist of both mixture, and further, while the ranges of the mixed ratio of the aforementioned carbon black for coloring and conductive carbon black are 65 / 35 - 95/5 The amount of the carbon black contained in the aforementioned thermosetting resin layer is the shading nature film according to claim 1 characterized by being 40 - 70 weight section in the amount of the total carbon black to the total resinous principle 100 weight section.

[0007] Moreover, invention according to claim 3 consists of a shading nature film according to claim 1 or 2 characterized by the thermosetting resin of the aforementioned thermosetting resin layer being polyurethane.

[0008]

[Embodiments of the Invention] Below, the form of operation of the shading nature film for the optical instruments of this invention is explained. Processability besides thermal resistance, rigidity, a mechanical strength, dimensional stability, weatherability, water resistance, and which chemical-resistant performance etc. is required for the base-material film used for the shading nature film of this invention, and although there are some restrictions, they can use various kinds of thermoplastics films. For example, the film of engineering plastics, such as a polyphenylene sulfide (PPS) besides being polyamides, such as polyester system resins, such as a polyethylene terephthalate and polyethylenenaphthalate, nylon 6, Nylon 66, Nylon 12, and nylon MXD-6,

poly vinylidene chloride, a polycarbonate, polypropylene, etc., a polyether ketone (PEEK), a polysulfone (PSF), polyether sulphone (PES), polyether imide (PEI), and a polyimide (PI), can also be used. Especially when the aforementioned performance, processability, etc., such as free, cost and thermal resistance, and rigidity, are synthetically taken into consideration, biaxial extension polyester film is suitable.

[0009] And it is desirable to make such a base-material film contain black pigment, such as carbon black, on the film itself. When the shading nature film which is prepared in the field of both base-material films and which it assists the shading nature given by the thermosetting resin layer containing carbon black etc. and not only raises it, but was obtained is cut into a predetermined configuration and the member of optical instruments, such as a drawing wing, is made by that cause, the beam of light which invades from end faces, such as a cutting plane of a film, can also be shaded. The range of 30 micrometers - 150 micrometers is suitable for the thickness of such a base-material film. When rigidity runs short when thickness is less than 30 micrometers, and thickness exceeds 150 micrometers, since it is inferior to lightweight nature, it is not desirable.

[0010] As mentioned above, the shading nature film of this invention needs to excel in slipping nature, abrasion resistance, antistatic nature, and smoothness with lightweight nature and shading nature, and is characterized by preparing the thermosetting resin layer which made the field of both aforementioned base-material films contain carbon black, lubricant, and a flattening from this point. Generally the hardening film of thermosetting resin has hardness, and since it excels also in thermal resistance, it is suitable at the point which raises the abrasion resistance of a shading nature film, and thermal resistance. And it not only can give the performance to both sides, but by preparing the aforementioned thermosetting resin layer in the field of both base-material films, the physical properties of front reverse side both sides become the same, generating of curl is also suppressed, and it can raise smoothness.

[0011] As thermosetting resin used for such a thermosetting resin layer, phenol resin besides polyurethane, alkyd resin, acrylic resin, an unsaturated polyester resin, an epoxy ester resin, an epoxy resin, an epoxy acrylate system resin, an urethane acrylate system resin, a polyester acrylate system resin, and a polyether acrylate system resin, melamine resin, a diallyl phthalate resin, a urea-resin, etc. are mentioned, and the thing which mixes [ independence or ] these may mix and use two or more sorts, for example.

[0012] The method of preparing a thermosetting resin layer in the field of both base-material films The carbon black, the predetermined lubricant, and the predetermined flattening of the quality of the material in the liquid of the above thermosetting resin, or a solution It is made to distribute uniformly in a predetermined amount, respectively, and considers as application liquid. this by well-known application meanses, such as a roll coat, a micro bar coat, and an air knife coat It can apply, when required, an unnecessary solvent component can be dried, and it can prepare by making it react and harden on heating or the heating pressurization conditions of being suitable, further. As for what free and hardening conditions take an elevated temperature or heating pressurization, in respect of productivity, what can be hardened as much as possible at low temperature is desirable preferably.

[0013] Moreover, depending on the kind of thermosetting resin, there are some which can use ultraviolet-rays (UV) irradiation and electron ray (EB) irradiation for a hardening means, and productivity can be remarkably raised by making it harden using the irradiation equipment which corresponds, respectively. Since application liquid is made to contain carbon black so much in the case of free and this invention, since ultraviolet rays are absorbed by carbon black and efficiency falls, the electron beam irradiation of irradiation of ultraviolet rays (UV) is more effective.

[0014] Thus, on the occasion of selection of thermosetting resin, it is necessary to also judge synthetically a performance side, such as adhesion with a base-material film, and intensity of a paint film, collectively with the quality of the productivity by the hardening condition etc. Polyurethane is synthetically excellent in performances, such as the above-mentioned adhesion and abrasion resistance, and processability, economical efficiency, etc. in this point and the aforementioned thermosetting resin, and they are especially desirable in. a group which has the urethane bond (carbamate combination) from which polyurethane is obtained by the reaction of the poly isocyanate and a polyol -- it is a polymeric material and various polyurethane is obtained according to the kind of the poly isocyanate used for a reaction, and polyol

[0015] For example, although linear thermoplastic polyurethane is obtained when any compound which reacts is two functionality, in this invention, such thermoplastic polyurethane is excepted and uses the polyurethane which has the network structure obtained when either is three or more functionality at least, or when a side-chain reaction occurs. Moreover, the poly isocyanate and the compound which reacts have the matter which has active hydrogen other than the matter which has a hydroxy group, such as an amino group, and a great portion of polyurethane is the complicated poly isocyanate guidance polymer which combination of the urethane constituted by the poly isocyanate and the \*\*\*\*\* hydride reacting, a urea, AROFANATO, a buret, etc. contains complexly in polymer. Therefore, in the case of polyurethane, there is an advantage which can be adjusted to characters various from a comparatively soft thing to a stiff thing according to the structure of the compound made to react etc.

[0016] In the shading nature film of this invention, since it becomes easy to produce the crack of a paint film even if too hard, as for a thermosetting resin layer, it is desirable to have the flexibility which is the grade which a crack does not produce in winding up of the shading nature film after processing, the handling of others, etc. Although for that it can be coped with also by adjustment of the constituent of thermosetting resin itself, flexibility can also be given, for example by adding thermoplastics, such as a vinyl chloride-vinyl acetate copolymerization resin, further. Moreover, addition of thermoplastics can be utilized also for improvement in the adhesion to the base-material film of a thermosetting resin layer.

[0017] And the carbon black which a thermosetting resin layer is made to contain is added in order to give conductivity and to prevent electrification of static electricity, while coloring a thermosetting resin layer black and giving shading nature. Therefore, it is desirable to use together two kinds, the carbon black for coloring excellent in coloring nature and the conductive carbon black

suitable for conductive grant, at least. As carbon black for coloring, channel black, lamp black, the furnace black for coloring, acetylene black, etc. are mentioned, and KETCHIEN black, the furnace black for electric conduction, etc. are mentioned as conductive carbon black. And the range of 40 - 70 weight section has [ the addition to desirable still such / the rate of a compounding ratio of the carbon black for coloring, and conductive carbon black / the range of 65:35-95:5 / a thermosetting resin layer of carbon black ] the desirable amount of the total carbon black to the total resinous principle 100 weight section of a thermosetting resin layer. Thus, by constituting, shading nature and conductivity, i.e., antistatic nature, can be given now much more effectively. And without not affecting surface slipping nature but grinding against friction etc., since it is not the method of making an antistatic agent adhering to a front face by application etc., the antistatic nature is durable and can also make a surface-electrical-resistance value small enough.

[0018] It adds, in order that it may raise surface abrasion resistance while it makes small frictional resistance at the time of an operation, when the lubricant which a thermosetting resin layer is made to contain improves surface slipping nature and processes it into a drawing wing etc., and a polyethylene wax, paraffin wax, a fatty-acid amide, silicon resin, a fluorine system resin, molybdenum disulfide, etc. are specifically mentioned. And kind independence or two sorts or more can be mixed and used out of these. Moreover, although the addition of such lubricant changes also with kinds of lubricant, its range about lubricant 3 - 35 weight sections is desirable to the total resinous principle 100 weight section of a thermosetting resin layer. When the addition of lubricant runs short of slipping nature and exceeds 35 weight sections under in 3 weight sections, it is not desirable for it to be partial, to rub by friction, by many Japanese cryptomeria, and to produce omission etc.

[0019] Moreover, surface glossiness is made low and reflection of an incident light is lessened, it adds in order to make the black coloring layer by carbon black absorb light efficiently and to raise shading nature, and a micro silica, a calcium carbonate, an alumina, etc. can be used for the flatting which a thermosetting resin layer is made to contain. A flatting 8 - 25 weight sections grade are suitable for the addition of a flatting to the total resinous principle 100 weight section of a thermosetting resin layer. Since surface glossiness becomes high too much or the fall of slipping nature is produced when the addition of a flatting is under 8 weight sections, it is not desirable, and if 25 weight sections are exceeded, since [ being partial ] it rubs, and omission is produced or it also becomes the hindrance of slipping nature further, it is not desirable by friction. The thermosetting resin layer thickness constituted as mentioned above has desirable 5-15 micrometers. Since the thickness in which it is difficult for to be easy to produce a pinhole etc. and to obtain sufficient shading nature when thickness is less than 5 micrometers, and it exceeds 15 micrometers does not have the need and it becomes easy to produce the crack of a paint film etc. rather, it is not desirable.

[0020]

[Example] An example and the example of comparison are given to below, and this invention is explained to it still more concretely. However, this invention is not limited to these examples. As a base-material film which makes thermoplastics a principal component, the biaxial extension polyethylene-terephthalate film [lumiler X30 Toray Industries, Inc. make] of black coloring is used, and it is a roll coater (3 roll methods) about the application liquid for thermosetting resin layers of composition of the examples 1-3 of the following [ field / of the both ], and the example 1-3 of comparison. The thickness at the time of dryness performed aging processing for two weeks at an application, dryness, and 40 degrees C, formed each thermosetting resin layer so that the front reverse side might serve as 10 micrometers of each, and it created the shading nature film of examples 1, 2, and 3 and the examples 1, 2, and 3 of comparison.

[0021]

Composition \*\* thermosetting resin of the application liquid for thermosetting resin layers of an example 1 (polyurethane)  
An acrylic acid, hydroxypropyl acrylate, and styrene, Methyl methacrylate, butyl methacrylate, butyl bitter taste The acrylic polyol which consists of RIRETO The 105 weight sections Xylylene diisocyanate prepolymer Carbon black for 40 weight sections \*\* coloring Furnace black for coloring 70 weight sections \*\* conductivity carbon black KETCHIEN black 20 weight section \*\* flatting (micro silica) 25 weight sections \*\* lubricant (fluororesin powder) 30 weight sections \*\* solvent (toluene / ethyl-acetate weight ratio 1:1) The 750 weight sections. [0022]

Composition \*\* thermosetting resin of the application liquid for thermosetting resin layers of an example 2 (polyurethane)  
An acrylic acid, hydroxypropyl acrylate, and styrene, Methyl methacrylate, butyl methacrylate, butyl bitter taste The acrylic polyol which consists of RIRETO 80 weight sections Xylylene diisocyanate prepolymer 75 weight sections \*\* addition thermoplastics Vinyl chloride vinyl acetate copolymer Carbon black for 40 weight sections \*\* coloring Furnace black for coloring 70 weight sections \*\* conductivity carbon black KETCHIEN black 25 weight sections \*\* flatting (micro silica) 10 weight section \*\* lubricant (fluororesin powder) 10 weight sections \*\* solvent (toluene / ethyl-acetate weight ratio 1:1) The 765 weight sections.

[0023]

Composition \*\* thermosetting resin of the application liquid for thermosetting resin layers of an example 3 (polyurethane)  
An acrylic acid, hydroxypropyl acrylate, and styrene, Methyl methacrylate, butyl methacrylate, butyl bitter taste The acrylic polyol which consists of RIRETO The 100 weight sections Xylylene diisocyanate prepolymer 58 weight sections \*\* addition thermoplastics Vinyl chloride vinyl acetate copolymer Carbon black for 60 weight sections \*\* coloring Furnace black for coloring 85 weight sections \*\* conductivity carbon black KETCHIEN black 35 weight sections \*\* flatting (micro silica) 20 weight section \*\* lubricant (fluororesin powder) 15 weight section \*\* solvent (toluene / ethyl-acetate weight ratio 1:1) The 685 weight sections.

[0024]

Composition \*\* thermosetting resin of the application liquid for thermosetting resin layers of the example 1 of comparison (polyurethane)

An acrylic acid, hydroxypropyl acrylate, and styrene, Methyl methacrylate, butyl methacrylate, butyl bitter taste The acrylic polyol which consists of RIRETO The 100 weight sections Xylylene diisocyanate prepolymer Carbon black for 40 weight sections \*\*

coloring Furnace black for coloring 40 weight sections \*\* conductivity carbon black KETCHIEN black 60 weight section \*\* flattening (micro silica) 20 weight sections \*\* lubricant (fluororesin powder) 10 weight sections \*\* solvent (toluene / ethyl-acetate weight ratio 1:1) The 770 weight sections. [0025]

Composition \*\* thermosetting resin of the application liquid for thermosetting resin layers of the example 2 of comparison (polyurethane)

An acrylic acid, hydroxypropyl acrylate, and styrene, Methyl methacrylate, butyl methacrylate, butyl bitter taste The acrylic polyol which consists of RIRETO The 100 weight sections Xylylene diisocyanate prepolymer 70 weight sections \*\* addition thermoplastics Vinyl chloride vinyl acetate copolymer Carbon black for 35 weight sections \*\* coloring Furnace black for coloring 120 weight sections \*\* conductivity carbon black KETCHIEN black 5 weight section \*\* flattening (micro silica) 10 weight section \*\* lubricant (fluororesin powder) 10 weight sections \*\* solvent (toluene / ethyl-acetate weight ratio 1:1) The 720 weight sections. [0026]

Composition \*\* thermosetting resin of the application liquid for thermosetting resin layers of the example 3 of comparison (polyurethane)

An acrylic acid, hydroxypropyl acrylate, and styrene, Methyl methacrylate, butyl methacrylate, butyl bitter taste The acrylic polyol which consists of RIRETO 80 weight sections Xylylene diisocyanate prepolymer 59 weight sections \*\* addition thermoplastics Vinyl chloride vinyl acetate copolymer Carbon black for 40 weight sections \*\* coloring Furnace black for coloring 70 weight section \*\* conductivity carbon black KETCHIEN black 25 weight sections \*\* lubricant (fluororesin powder) 10 weight sections \*\* solvent (toluene / ethyl-acetate weight ratio 1:1) The 775 weight sections. [0027] [Evaluation and result] About each shading nature film of the examples 1, 2, and 3 created as mentioned above and the examples 1, 2, and 3 of comparison, the following method estimated the application fitness at the time of processing, and the acquired physical properties of a shading nature film, and the result was collectively shown in Table 1.

[0028] (1) When the application liquid for thermosetting resin layers of each sample was applied to an application fitness base-material film by the roll coater (3 roll methods), the coating fitness, the existence of blocking, etc. were evaluated [ whether it has applied to predetermined thickness satisfactory, and ], when satisfactory, it considered as fitness O, and when there was a problem, it was shown in Table 1 as defect x.

[0029] (2) Shading nature JIS Based on K7651, the optical density of each sample was measured using the optical-density meter (Macbeth TD-904), and the thing (5<) exceeding 5 considered as fitness O as full shading nature, and showed five or less thing (5>=) in Table 1 as defect x as imperfect.

[0030] (3) Lusterless nature (surface glossiness estimates)

JIS The method 3 (60-degree specular gloss) of Z8741 specular-gloss measuring method was followed, the surface glossiness (%) of each sample was measured, the lusterless nature of ten or less thing was good, surface glossiness considered as O, and the thing exceeding 10 was shown in Table 1 as x by the insufficiency of lusterless nature.

[0031] (4) Slipping nature JIS K7125 was followed, the coefficient of static friction of each sample and the dynamic friction coefficient were measured on condition that 200g of loads, and speed 100 mm/min, and the coefficient of static friction (microsecond) showed that to which a dynamic friction coefficient (muk) makes 0.25 or less thing slipping nature fitness O, a coefficient of static friction (microsecond) exceeds 0.30, and a dynamic friction coefficient exceeds 0.25 or less by 0.30 in Table 1 as slipping poor nature x.

[0032] (5) Conductivity (static electricity diffusibility)

The surface electrical resistance of each sample is measured by U.S. MIL DOD-STD -1686, and a surface-electrical-resistance value is 109. The following [ omega/\*\* ] consider as conductive (static electricity diffusibility) fitness O, and a surface-electrical-resistance value is 109. The thing exceeding omega/\*\* was shown in Table 1 as conductive (static electricity diffusibility) defect x.

[0033] (6) After piercing wear-resistant each sample in the drawing wing configuration for cameras, it attached to the beam limiting device, and it was made to operate 1 million times, wear of a paint film side and the existence of peeling were investigated, the thing without wear and peeling considered as fitness O, and what wear and peeling are accepted in was shown in Table 1 as defect x.

[0034] (7) Adhesion (cross cut adhesion test)

In order to evaluate the adhesion of the coat of each sample. JIS Based on K5400, slitting of 11 every direction each is put into a paint film side at intervals of 1mm. After forming the squares of every direction ten trains each and sticking a cellophane adhesive tape [Scotch tape LD-18 Nichiban Co., Ltd. make] on the field, 25 the class [ 4th ] :% ablation of which performs the peel test of the direction of 180 degree, and class [ the / 5th ] :ablation is not done, 50 the class [ 3rd ] :% ablation, 75 the class [ 2nd ] :% ablation, the 1st class: It is the criteria of complete ablation \*\* and the grade judging was performed. Ablation of a coat did not have the judgment result in all samples, and the number of them was five (fitness O).

(Following margin)

[0035]

	実施例 1	実施例 2	実施例 3	比較例 1	比較例 2	比較例 3	
塗布適性	○	○	○	×	○	○	
遮光性（光学濃度）	○ 5<	○ 5<	○ 5<	×	○ 5<	○ 5<	
艶消し性 （60度鏡面光沢）	○ 4.0	○ 5.5	○ 4.3	○ 4.5	○ 4.9	×	15.0
滑り性 静摩擦係数 動摩擦係数	○ 0.22 0.19	○ 0.26 0.22	○ 0.25 0.22	○ 0.27 0.23	○ 0.28 0.22	×	0.32 0.30
導電性 表面抵抗値・Ω/□	○ 10 <sup>8</sup>	○ 10 <sup>8</sup>	○ 10 <sup>8</sup>	○ 10 <sup>8</sup>	×	○ 10 <sup>10</sup>	○ 10 <sup>8</sup>
耐磨耗性	○	○	○	○	○	○	
密着性 クロスカット試験	○ 5級	○ 5級	○ 5級	○ 5級	○ 5級	○ 5級	
総合評価	○	○	○	×	×	×	

[Table 1] Evaluation result.

[0036] Each shading nature film of examples 1, 2, and 3 was satisfactory and good about each performance below application fitness and shading nature so that clearly from the evaluation result shown in Table 1. On the other hand, it had few ratios of the carbon black for coloring than the limit, and since the shading nature film of the example 1 of comparison also had many amounts of the total carbon black to the total resinous principle a little, while it was inferior to shading nature, it is [ a problem ] and was faulty also in application fitness. And since the shading nature film of the example 2 of comparison has a little few ratios of conductive carbon black than a limit, a surface-electrical-resistance value becomes larger than criteria, and it is a little insufficient of conductivity. Moreover, since the shading nature film of the example 3 of comparison had not added the flatting, while surface glossiness became higher than criteria and lusterless nature was insufficient for it, it had a problem a little also in slipping nature.

[0037]

[Effect of the Invention] As explained in detail above, invention indicated to the claim 1 is the shading nature film which prepared and constituted the thermosetting resin layer containing carbon black, lubricant, and a flatting in the field of both base-material films which make thermoplastics a principal component. While the adhesion of a thermosetting resin layer is good and excellent in abrasion resistance by taking such composition, the effect that the shading nature film excellent in shading nature, lusterless nature, and slipping nature, smoothness (there needs to be no curvature), and lightweight nature can be offered with sufficient productivity is done so. Therefore, since it is also lightweight, and the automatic regulation of a camera etc. is performed with a sufficient precision and a motor load is also mitigated at the same time it has all the above-mentioned performances needed, when a stop wing etc. is created using such a shading nature film, the outstanding effect that a battery life is also further extensible is done so.

[0038] And invention according to claim 2 is set on the shading nature film of invention indicated to the aforementioned claim 1. The carbon black contained in a thermosetting resin layer The carbon black for coloring, It consists of mixture with conductive carbon black. and this carbon black for coloring Channel black, lamp black, the furnace black for coloring, It consists of a kind or two sorts or more of mixture chosen from acetylene black. This conductive carbon black Either [ moreover, ] KETCHIEN black or conductive furnace black. Or consist of both mixture, and further, while the ranges of the mixed ratio of the aforementioned carbon black for coloring and conductive carbon black are 65 / 35 - 95/5 To the total resinous principle 100 weight section, the amount of the carbon black contained in the aforementioned thermosetting resin layer constitutes so that it may become 40 - 70 weight section in the amount of the total carbon black. By taking such composition, in addition to the aforementioned performance, good shading nature, surface slipping nature, etc. are not affected, but the shading nature film which was moreover excellent in endurance and has advanced antistatic nature is obtained.

[0039] Moreover, in the aforementioned claim 1 or a shading nature film according to claim 2, invention according to claim 3 uses polyurethane for the thermosetting resin of a thermosetting resin layer, and the adhesion of polyurethane to a base-material film is good, and it can form the paint film which was rich also in flexibility while adjustment of the hardness of a paint film is also easy and the outstanding abrasion resistance was maintained since versatility was moreover in component combination. Therefore, while being able to improve various kinds of aforementioned performances further, the effect that the shading nature film excellent also in processability can be offered is done so.

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[Translation done.]